## REMARKS

The claims were rejected under 35 USC 103(a) as being obvious over Holenka in view of Mathis. Favorable reconsideration of this application is requested in view of the above amendments and the following remarks.

### 103 Rejection

The claims have been rejected based on a combination of Holenka and Mathis. Holenka is cited as teaching a suitable while drilling tool for making density and PEF measurements of a earth formation surrounding a borehole. Mathis is cited for the very general teaching that a tool can make both formation measurements and mud measurements. Applicants' respectfully assert that the combination of Holenka and Mathis is improper for the stated teaching. Further, even if a proper combination is conceded, the resultant combination is not suggestive of Applicants' claimed measurement technique.

### Improper Combination

Applicants' first note that the tools disclosed in Holenka and Mathis are very different. Holenka is a while drilling tool that is rotated during measurement cycles to obtain azimuthal images of the formation. Mathis is a wireline tool that makes measurements in a single direction in front of the tool. In the normal case, the tool is pressed against the formation by a spring device. In other cases, the back face of the tool is purported to rest against the borehole such that the front face is in contact with the mud rather than the formation. In either case, Mathis makes no provision for tool rotation.

In addition to different tool configurations, the measurement techniques of Holenka and Mathis are also very different. Holenka is by design configured to make measurements circumferentially about the borehole axis. Holenka discloses a specific segmenting process that is a function of angular position. Holenka associates measurements at different angular position to obtain a set of measurements that define azimuthal characteristics of the formation at a particular depth. Mathis is simply non-analogous for these type of azimuthal measurements. Specifically, Mathis does not teach or suggest associating multiple downhole measurements in this manner.

A person of ordinary skill would not consider the teaching of Mathis as being instructive to the teachings of Holenka. First, the tools described in each reference, although both density tools, are directed to wholly different applications, Mathis to a wireline tool and Holenka to a

drilling tool. Second, the measurement techniques are wholly different. Thus, while Mathis mentions, in only one instance, that a tool may use spring-type standoffs for formation measurements or be without standoffs for mud measurements, there is no support for the position that this concept may be applied in a drilling environment. Further, any combination of the references relating to a common measurement technique teaching fails due to the basic differences in the measurement techniques disclosed in each reference. For at least these reasons, Applicants respectfully assert the combination of Holenka with Mathis for the stated teaching is improper.

**Combination fails to obviate**

Even assuming for a moment the combination of Holenka and Mathis is proper, their combination fails to teach or suggest Applicants' claimed mud measurement techniques. With respect to Holenka alone, the Office Action concedes that Holenka fails to disclose the comparing step applied to a mud mixture. The Office Action then states that the comparing step would be obvious to one of ordinary skill in the art in light of the Holenka reference, along the teaching of Mathis that mud density can be made by a side-looking wireline tool. In support, the Office Action cites to Holenka to make the analogy with formation heterogeneity. However, the determination of formation heterogeneity does not include the further step of comparing measurements from multiple angular segments with a known mud characteristic or quantity. Heterogeneity determinations do not require this additional step.

Further, Mathis does not contribute to obviating Applicants' comparison step. Mathis nowhere suggests a comparison be made between downhole measurements and a known mud characteristic, as claimed by Applicants. The citation given in support of the rejection on this point, col. 7:15-17, only mentions that mud density measurements can be made at the surface or by a side-looking wireline tool. Thus, Mathis adds nothing regarding a teaching suggestive of Applicants' comparison step.

## CONCLUSION

The Applicants believe this paper is fully responsive to each and every ground of rejection and objection cited by the Examiner in the Office Action dated June 5, 2002, and respectfully request reconsideration of the application.

Please charge any applicable fees, or apply any excess, to deposit account number 19-0610.

Respectfully submitted,

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Date

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